Deriving Adposition and Noun Phrase Structure in Moro
Peter Jenks (Harvard University)
ACAL 41, Toronto
May 6, 2010

1. INTRODUCTION

- This paper describes and proposes an analysis of Moro (Kordofanian) noun phrases and adpositions, as well as related facts about passivization.


(1) n-ádám n-átfíán n-ágotʃán nore N-Dem-Num-Adj
CL.PL-books CL.PL-those CL.PL-two CL.PL-red *
‘those two red books’

- **Puzzle 1**: Prepositions in Moro appear between nouns and demonstratives:

(2) é-ga-dan-ó [PP tóbésá ékáré íd-átí-ðá] eřéka
1SG-AUX-sit-PRF table under CL.PL-that-CL.PL yesterday
‘I sat under that table yesterday.’

- **Puzzle 2**: Passivization can strand prepositions; adnominal modifiers can stay to the right of that preposition:

(3) tóbésá d-á-ðá-dan-ðan-ékáré íd-átí-ðá
CL.PST-AUX-sit-PAS-(PRF)-under CL.PL-that-CL.PL
‘That table was sat under.’

**The Claim**: (1-3) all involve the same basic process: “narrow” NP movement.

- In (1) the noun (the “NP”) moves to the left edge of the extended NP phrase (the “DP”) (Cinque 2005, Collins 2004):

(4) ...

[DemP NP [Dem Dem [NumP Num [Adj Adj t_i]]]]

- This same NP can move past the preposition to its specifier position in (2):

(5) ...

[PP NP [P P [DemP t_i [Dem Dem ... ]]]]

- The same NP is targeted by passivization producing (3).

(6) ...

[IP NP [I I ... [VP V [PP P [DemP t_i [Dem Dem ... ]]]]]]

- Thus, DP syntax feeds clausal syntax in Moro.

*Abbreviations: CL.SG – singular noun class (or agreement); CL.PL – plural noun class (or agreement); 1SG – first person singular; AUX – finite verb auxiliary; PST – past tense; PRF – perfective aspect; IMP – imperfective aspect; PAS – passive; IN – inessive case; AD – adessive case.
- A further claim: Moro DP order cannot be derived by head movement, which has been proposed to account for the same order in Swahili (Carstens 1991).

**OUTLINE**

§2: Moro morphosyntax  
§3: The position of nouns in DPs and PPs  
§4: An analysis of DPs, PPs, and passives via “narrow” NP movement  
§5: Arguments against head movement  
§6: Discussion and conclusion

2. **BASIC MORO SYNTAX**

- Moro is a Kordofanian (Niger-Congo) language spoken in the Nuba mountains in central Sudan:

  - Clauses have the order SVO:

    \[(7) \quad \text{l-owándřa l-ʌ-murk-ú n-ain} \]
    \[
    \text{CL-rock CL-AUX-roll-PRF AD-mountain}
    \]
    \`
    \['The rock rolled down the hill.'\`

  - No article system or augment vowels (von Staden 1973); this means that bare NPs can be definite arguments.

  - Moro has a rich set of noun classes (Gibbard et al 2009, Appendix 1).

  - Verbal morphology can be split into a “preverb” and “macrostem,” distinguished as phonological domains (Jenks & Rose to appear).

3. **THE POSITION OF NOUNS IN MORO**

Section 3.1 The DP-internal word order of Moro is typologically uncommon.  
Section 3.2 Modifiers with higher scope are farther to the left in Moro.  
Section 3.3 Moro adpositions occur between nouns and the rest of the DP.

- I will conclude from these observations that nouns in Moro are always displaced from their base position.

3.1 **A CROSSLINGUISTIC PERSPECTIVE ON DP ORDER**

- This section establishes that the position of the noun in Moro DPs is typologically unusual.
- The relative position of nominal modifiers in Moro DPs is fixed:

(8) **BASIC WORD ORDER IN THE MORO NP**

a. n-ádám n-átíña n-ágətʃən n-ore  \textit{N-Dem-Num-Adj}
   \hspace{1cm} \textit{CL-books CL-those CL-two CL-red}

b. * nádám nátíña nore nágətʃən  \textit{*N-Dem-Adj-Num}

c. * nátíña nádám nágətʃən nore  \textit{*Dem-N-Num-Adj}

d. * nádám nágətʃən nátíña nore  \textit{*N-Num-Dem-Adj}

- This same Moro order is also attested in Northeast Bantu:

\begin{tabular}{ll}
\textbf{Kiswahili} & (Carstens 1991) \\
\textbf{Kiitharaka} & E.54, Kenya \textbf{(Muriungi 2008)} \\
\textbf{Kikuyu} & E.50, Kenya \textbf{(Greenberg 1963)} \\
\textbf{Nkore-Kiga} & J.10, Uganda \textbf{(Taylor 1985)} \\
\end{tabular}

- The DP orders in (9a-b), where nouns are adjacent to adjectives, are more frequent typologically (Cinque 2005, Greenberg 1963, Rijkhoff 1991):

(9)  

a. N – Adj – Num – Dem  

b. Dem – Num – Adj – N  

c. N – Dem – Num – Adj = \textit{Moro}

- Greenberg describes (9c) as a “less popular alternative” (1963:87).

- Yet all that is strange about the Moro order is the position of the noun.

- We can account for the order of modifiers in Moro if we assume that Moro DPs underlyingly have the order in (9b) and are consistently right-branching: [ Dem [ Num [ Adj [ N ]]]].

### 3.2 More on DP-internal Word Order and Scope

- This section establishes that DPs in Moro are like languages with N-final DPs with respect to scope and adjective ordering, in addition to basic word order.

- **Ordinal and cardinal numerals:** In sentences with both ordinal and cardinal numerals, the element which has higher scope is on the left:

(10) \textit{wíl k-íŋən’əŋ k-əŋətʃín}  
   \textit{picture} \hspace{1cm} \textit{CL-first} \hspace{1cm} \textit{CL-three}  
   ‘the first three pictures’

(11) \textit{wíl k-əŋətʃín k-íŋən’əŋ}  
   \textit{picture} \hspace{1cm} \textit{CL-three} \hspace{1cm} \textit{CL-first}  
   ‘the three first pictures’
- **Adjective ordering:** Applies left-to-right, as expected for right-branching DPs:

(12) LENGTH > COLOR

a.  é-ga-dan-ó n-třbésá δ-owala δ-ore
    1SG-AUX-sit-PRF on-table CL-long CL-red
    ‘I sat on the long red table.’

b.  ?? é-ga-dan-ó n-třbésá δ-ore δ-owala
    1SG-AUX-sit-PRF on-table CL-red CL-long

(13) WEIGHT > SIZE

a.  é-ga-dan-ó n-třbésá δ-ogəna δ-iniə
    1SG-AUX-sit-PRF on-table CL-big CL-heavy
    ‘I sat on the big heavy table’

b.  ?? é-ga-dan-ó n-třbésá δ-iniə δ-ogəna
    1SG-AUX-sit-PRF on-table CL-heavy CL-big

(14) SIZE > LENGTH

a.  é-ga-dan-ó n-třbésá δ-ogəna δ-vəalano
    1SG-AUX-sit-PRF on-table CL-big CL-long
    ‘I sat on the big long table’

b.  ?? é-ga-dan-ó n-třbésá δ-əalano δ-əogəna
    1SG-AUX-sit-PRF on-table CL-long CL-big

- This ordering gives evidence that modifiers are not reduced relative clauses 
  (Sproat and Shih 1991), a potential alternative account of Moro’s DP-order.

- Another argument against reduced relative clauses: modificational vs.
  predicational adjectives:

(15) a.  třbésa δoɡəna ‘a/the big table’

b.  třbésa δoɡəná ‘The table is big.’

- Conclusion: Moro DPs are genuinely right branching.

### 3.3 The pre-prepositional position of nouns

- The position of nouns relative to adpositions is also surprising in Moro.

- At first glance, Moro adpositions appear to be postpositions:

(16) NOUN ADPOSITION

a.  logopáj édápé ‘on top of the cup’
    cup on.top.of

b.  logopáj ékáré ‘below/under the cup’

c.  logopáj ékárél ‘beside the cup’

d.  logopáj ilikánó ‘between the cups’

e.  logopáj ndřea ‘around the cup’
However, nominal modifiers follow these adpositions:

(17) \[[N-P-Dem]\]
\[
\text{í-ga-gú} \quad \text{dáwá lá} \quad [\text{pp \ ádám \ ékáré \ ik-átí-ka}] \\
1\text{sg-aux-put-prf} \quad \text{money} \quad \text{book} \quad \text{under} \quad \text{Cl-that-cl}
\]

(18) \[[N-P-Dem-Num]\]
\[
\text{kúkú} \quad \text{k-andr-ó} \quad [\text{pp \ n-tibésá \ édápé \ íd-átí-ða} \ \text{ð-agatʃín}] \\
\text{Kuku} \quad \text{Cl-sleep-prf} \quad \text{AD-table} \quad \text{on.top} \quad \text{Cl-that-cl} \quad \text{Cl-three}
\]

Modifiers cannot accompany the noun before the adposition:

(19) * \[\text{í-ga-gú} \quad \text{dáwá lá} \quad [\text{pp \ ádám} \ \text{k-átí-ká} \ \text{ékáre}] \\
1\text{sg-aux-put-prf} \quad \text{money} \quad \text{iN-book} \quad \text{Cl-that-cl} \quad \text{under}
\]

(20) * Kúkú \quad k-andr-ó \quad [\text{pp \ n-tibésá} \ \text{ð-agatʃín} \ \text{édápé} \ \text{í-ð-átí-ða}] \\
Kuku \quad \text{Cl-sleep-prf} \quad \text{on-table} \quad \text{Cl-three} \quad \text{on.top} \quad \text{Cl-that}

The data in (19–20) indicate that the adposition is not a postposition, and thus, that (17–18) do not involve extraposition.

- If a demonstrative follows the preposition, the noun can follow the preposition and receive case (see Appendix 2).

4.0 Analysis: “Narrow”-NP Movement

- Base Structure: Moro DPs are underlyingly noun-final, and modifiers are in functional projections which contain the NP (cf. Cinque 2005):

(21) \[\text{DemP} \quad \text{Dem} \quad [\text{NumP} \quad \text{Num} \quad [\text{AP} \quad \text{A} \quad [\text{NP} \quad \text{N} \quad \text{]]}]\]

- This is the typologically common word order for right-branching language.

- I will make the simplifying assumption that DemP = DP.

4.1 DP-internal NP Movement

Analysis: DP-internal concord in Moro triggers movement.

i. Nominal modifiers search their complement for an noun to agree with (Chomsky 1995).

ii. When they agree with that noun (NP), it moves to their specifier.

(22) a. nádám \ n-áti-ða \ n-átátʃán \ n-ore \ N-Dem-Num-Adj \\
\text{Cl-books} \quad \text{Cl-those-cl} \quad \text{Cl-two} \quad \text{Cl-red} \\
‘Those two red books’
- Collins (2004) proposes a similar derivation for the Swahili DP and connects it with a parameter stating that agreement in Swahili is always accompanied by movement (see also Baker 2008, Carstens 2005).
- This may be a shared trait between Moro and Swahili/Bantu.

### 4.2 Deriving Adposition Structure

**Analysis:** Categorical-selection in Moro also can trigger NP movement.

i. Prepositions subcategorize for nouns, which, like agreement, is accomplished by feature checking (Matushansky 2006, Svenonius 1994).

ii. When P finds the NP it selects, the NP moves to its specifier position.

(23) a. í-q-ʌg-ú  ðówálá  [pp  ádám  ékáré  k-ʌtí-ká ]  
    1SG-AUX-put-PRF money book under CL-that-CL 
    ‘I put the money under that book.’
Evidence for the constituency of \([P+\text{Dem}]\) is provided by coordination:

\[(24) \quad \text{COORDINATION OF } P'\]

\(\text{é-ga-dań-ó} \quad [_{P} \text{ékaré-ði} \quad \ddot{\text{tibésá}}] \quad \text{I sat under this and on top of that table.} \quad \text{ékaré} \quad \text{ádám} \quad \text{katíka} \quad \text{NP} \quad \text{DemP} \quad \text{Dem'} \quad \text{...}\)

If (24) is correct, this must be a case of across-the-board movement (Ross 1987[1967]), as shown, with intermediate traces omitted.

Unlike agreement, movement is optional with c-selection. Case-marking seems to be an alternative to movement in some environments (Appendix 2).

The ability of NPs to strand the DP remnant follows from two ideas:

a) \(D^0\) is a phase head (Chomsky 2001).

b) Moro NPs are at the edge of the DP.

This predicts that NPs should be able to move beyond not only DP but beyond PP as well. Below, this is prediction is borne out.
4.3 NP movement in passivization

- Three patterns of passivization with PPs:

(25) a. \([\text{IP } \text{NP}_i \ldots [\text{VP } [\text{PP } \text{NP}_i \ P \ \text{DP }]]] \)
    b. \([\text{IP } \text{DP}_i \ldots [\text{VP } [\text{PP } \ P \ \text{DP}_i ]]] \)
    c. \([\text{IP } \text{PP}_i \ldots [\text{VP } [\text{PP } \ P \ \text{PP}_i ]]] \)

I ignore (c) below, which would introduce new complications.

(26) **Baseline**

kúkú k-andr-ó \([\text{pp } n-\text{iphery } édápé i-ð-átá-ðá δagatfín }]\)
Kuku CL-sleep-PRF AD-table on.top -CL-that-CL three
‘Kuku slept on top of those three tables.’

(27) **Example of (26a):**

\([\text{np } ̃ \text{iphery }] \ δá-ndër-n-ð-u [\text{pp } édápe i-ðátí-ðá δ-agatfín }]\)
Table CL-sleep-PAS-PRF-LOC on.top -CL-that-CL CL-three
‘Those three tables were slept on top of’

(28) **Example of (26b):**

\([\text{dp } ̃ \text{iphery } i-ð-átá-ðá δ-agatfín }] δá-ndër-n-ð-u [\text{pp } édápe ̃ \text{dp }]\)
Table -CL-that-CL CL-three CL-slept-PAS-PRF-LOC on.top
‘Those three tables were slept on top of.’

- When a PP is passivized, a locative suffix /-u/ appears on the verb.

- The examples rule out analyses of this phenomena as due to nonconfigurationality (Bresnan & Mchombo 1987) or extraposition:

(29) **Partial fronting is impossible**

* \([\text{dp } ̃ \text{iphery } iðáfí}] δá-ndër-n-ð-u [\text{pp } édápe δ-agatfín }]\)
Table -CL-that-CL ...slept-PAS... on.top CL-three

(30) **Coordination of the stranded PP**

\(̃ \text{iphery } δá-dań-an [\text{pp } ̃ \text{np } ̃ \text{p } -ékåré-ðí }] n- [\text{p } édápe ̃ \text{p } iðáfí}]\)
Table AGR-sit-PAS-(PRF) -under-this &- on.top that
‘The table was sat under this one and on top of that one.’

- **Analysis:** Agreement initiated by the verb with its internal argument triggers movement of the object NP or DP to subject position.

- **The locative suffix /-u/:** Occurs whenever locatives are displaced. Following Diercks (2009)’s analysis of the Bukusu locative clitic, it may head a Motion Phrase which licenses the locative NP as an argument of the verb:

(31) **Motion Phrase Licensing the Locative Argument of ‘Sleep’ (27)**

\([\text{ip } [\text{np } ̃ \text{iphery }] [r δá- ... ndër-n-ð-... [\text{motp } ̃ \text{np } [\text{mot } -u ... [\text{pp } ... ̃ \text{np} ... ]]]]]\)

- Besides passivization, narrow NP-movement is also possible in focus clefts, putative instances of A’- rather than A-movement.
5.0 ARGUMENTS AGAINST A HEAD MOVEMENT ANALYSIS OF MORO DPs

- An alternative analysis of Moro word order would be by head movement, as argued by Carstens (1991, 2000) for similar facts in Kiswahili. E.g.:

(32) \[
\begin{array}{c}
\text{DP} \quad N_i \quad \text{[FP DemP} \quad [F \quad t_i \quad [\text{NumP} \quad #P \quad [\text{Num} \quad t_i \quad \text{AP} \quad [\text{NP} \quad t_i \quad ]]]]]
\end{array}
\]

- The account in §4 cannot be rephrased as head movement, as it would violate the Head Movement Constraint (Travis 1984):

(33) \[
\begin{array}{c}
[\ldots \quad N^0_i \quad [P \quad P^0 \quad [t_i \quad \ldots \quad ]]]
\end{array}
\]

- The displacement of the “narrow” NP in Moro must be phrasal movement.
- The phrasal movement analysis also avoids the current controversy surrounding head movement (Matushansky 2006, Roberts to appear).

6.0 CONCLUSIONS

- The NP movement based account of DP order accounts for:
  i. The typological irregularity of Moro DP order
  ii. The position of adpositions between nouns and modifiers
  iii. The ability of nouns to strand adpositions and modifiers in passivization
- In turn, this analysis provides evidence for the following points:
  i. Like Bantu, Moro agreement searches upwards oriented/is always accompanied by movement (Baker 2008, Carstens 2005, Collins 2004).
  ii. Crosslinguistic differences in constituent order within noun phrases are due (in part) to phrasal movement (Shlonsky 2004, Cinque 2005).

ACKNOWLEDGMENTS

This work is part of the Moro Language Project (http://moro.ucsd.edu), which is possible only due to the generous assistance of our consultants, Elyasir Julima and Ikhlas Elahmer. I would also like to thank the other members of the Moro Language Project for helpful comments: Farrell Ackerman, George Gibbard, Laura Kertz, Sharon Rose, and Andrew Strabone. Thanks also to Michael Diercks and Maria Polinsky for helpful suggestions.

The work here was supported in part by the National Science Foundation (NSF) under Grant No. 0745973. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the NSF.
APPENDIX 1. MAJOR NOUN CLASSES IN MORO (From Gibbard et al. 2009, ex. 2)

<table>
<thead>
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<th>Class</th>
<th>Initial segment</th>
<th>Concord segment</th>
<th>Singular</th>
<th>Initial segment</th>
<th>Concord segment</th>
<th>Plural</th>
<th>Gloss</th>
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<td>V</td>
<td>g/-/k-</td>
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<td>l-</td>
<td>l-</td>
<td>lavaja</td>
<td>‘poor person’</td>
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<td></td>
<td>lðða</td>
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<tr>
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<td>V</td>
<td>g/-/k-</td>
<td>oτʃa</td>
<td>n-</td>
<td>n-</td>
<td>nøʃja</td>
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<td>ajén</td>
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<td>ején</td>
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<td>ðaba</td>
<td>r-</td>
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<td>‘cloud’</td>
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<tr>
<td>δ/j</td>
<td>δ-</td>
<td>δ-</td>
<td>ðamala</td>
<td>j-/front V-</td>
<td>j-</td>
<td>jamala</td>
<td>‘camel’</td>
</tr>
</tbody>
</table>

APPENDIX 2. LOCATIVE CASE-MARKING IN IN-SITU NP COMPLEMENTS OF P0

- A nouns can follow a preposition, provided
  i) it is marked with the inessive prefix é- (33).
  ii) it is followed by a demonstrative (33-35).

(34) a. í-ga-g-ú ððawálã [ áðáðm ékárá=kí ]
   1SG-AUX-put-PRF money book under=CL.SG.this
   ‘I put the money under this book.’

   b. í-ga-g-ú ððawálã [ ékárá ék-áðáðm=kí ]
   1SG-AUX-put-PRF money under IN-book=CL.SG.this
   ‘I put the money under this book.’

   c. * í-ga-g-ú ððawálã [ ékárá áðáðm=kí ]
   1SG-AUX-put-PRF money under IN-book=CL.SG.this
   ‘I put the money under this book.’

(35) í-ga-g-ú ððawálã [ ékárá ék-íáðáðm katíka ]
   1SG-AUX-put-PRF money under IN-book CL.SG.that
   ‘I put the money under that book.’

(36) * í-ga-g-ú ððawálã [ ékárá ék-íádáðmá ]
   1SG-AUX-put-PRF money under IN-book
   ‘I put the money under that book.’
REFERENCES


CONTACT:
pjenks@fas.harvard.edu